

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 8/5/24

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 8/6/2024 through 8/12/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1375	8.19	2.69	46.6
26A	58-003	Stoneco	425	2.53	2.69	14.4
2NS	63-114	Highland	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

<----- Verify this number is 100%



Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.3	100.0	100.0	99.7	0.3	0.3
3/4"	76.6	100.0	100.0	89.1	10.6	10.9
1/2"	38.1	99.4	100.0	71.1	18.0	28.9
3/8"	13.3	83.0	100.0	57.1	13.9	42.9
#4	3.0	7.8	99.0	41.1	16.0	58.9
#8	2.2	1.8	84.4	34.2	6.9	65.8
#16	1.4	1.2	66.2	26.6	7.6	73.4
#30	1.3	0.9	46.8	19.0	7.7	81.0
#50	1.2	0.8	18.9	8.0	10.9	92.0
#100	1.2	0.8	3.9	2.2	5.8	97.8
LBW	1.4	0.4	0.4	0.9	1.3	99.1

*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

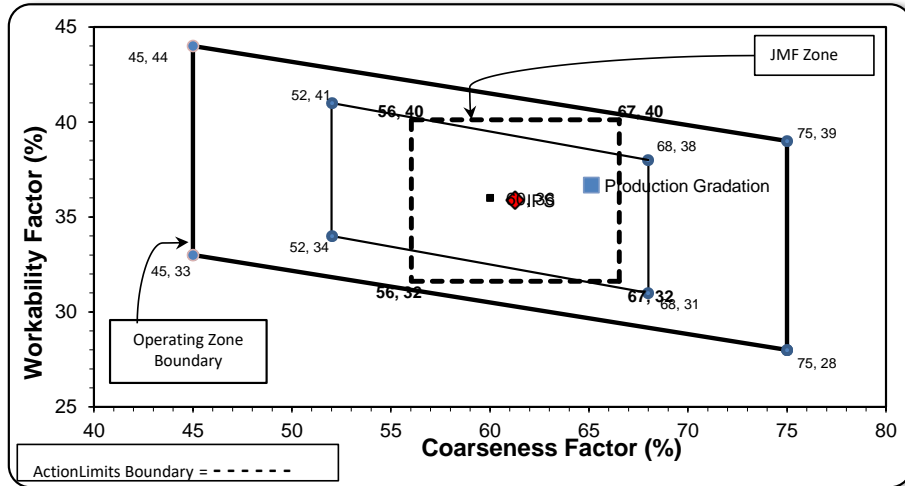
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	65	Workability Factor:	34	36.7
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Coarseness Factor:	61
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Workability Factor:	36
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-103**

Sample Date: 8/5/24

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 8/6/2024 through 8/12/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1375	8.19	2.69	46.6
26A	58-003	Stoneco	425	2.53	2.69	14.4
2NS	63-114	Highland	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

<----- Verify this number is 100%

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.3	100.0	100.0	99.7	0.3	0.3
3/4"	76.6	100.0	100.0	89.1	10.6	10.9
1/2"	38.1	99.4	100.0	71.1	18.0	28.9
3/8"	13.3	83.0	100.0	57.1	13.9	42.9
#4	3.0	7.8	99.0	41.1	16.0	58.9
#8	2.2	1.8	84.4	34.2	6.9	65.8
#16	1.4	1.2	66.2	26.6	7.6	73.4
#30	1.3	0.9	46.8	19.0	7.7	81.0
#50	1.2	0.8	18.9	8.0	10.9	92.0
#100	1.2	0.8	3.9	2.2	5.8	97.8
LBW	1.4	0.4	0.4	0.9	1.3	99.1



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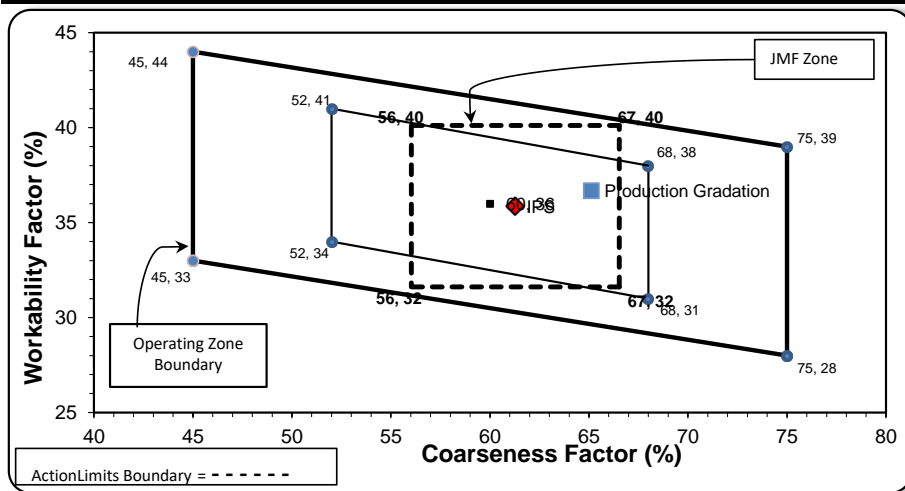
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	65	Workability Factor:	34	Adjusted WF	36.7
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Coarseness Factor:	61
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Workability Factor:	36
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

PREPARED BY:
 SM, LLC Technical Service

Approved BY:

Aggregate Optimization Chart

PLANT #: 12

Sample Date: 8/5/24

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 8/6/2024 through 8/12/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

<----- Verify this number is 100%



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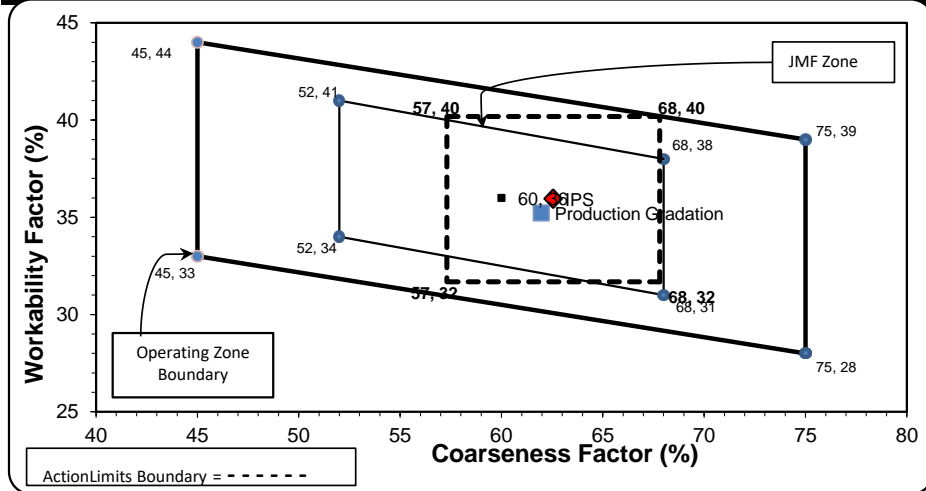
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.6	100.0	100.0	98.8	1.2	1.2
3/4"	77.2	100.0	100.0	88.6	10.2	11.4
1/2"	37.6	95.6	100.0	68.4	20.2	31.6
3/8"	19.6	85.2	100.0	58.3	10.1	41.7
#4	3.0	18.0	97.6	42.0	16.3	58.0
#8	2.0	3.9	79.1	32.7	9.3	67.3
#16	1.6	2.0	62.4	25.7	7.0	74.3
#30	1.5	1.7	46.4	19.3	6.4	80.7
#50	1.4	1.6	25.5	11.0	8.3	89.0
#100	1.4	1.5	7.1	3.7	7.3	96.3
LBW	1.0	1.3	1.0	1.0	2.6	99.0

*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:	62	Workability Factor:	33	Adjusted WF	35.2	Coarseness Factor:	63
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Workability Factor:		36	
Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.0	10.3	11.0
1/2"	70.3	18.7	29.7
3/8"	59.9	10.4	40.1
#4	41.9	18.0	58.1
#8	35.9	6.0	64.1
#16	27.8	8.2	72.2
#30	18.9	8.8	81.1
#50	6.3	12.6	93.7
#100	1.7	4.6	98.3
LBW	1.0	0.7	99.0

PREPARED BY:
 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: p11

Sample Date: 8/5/24

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 8/6/2024 through 8/12/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

<----- Verify this number is 100%



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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.6	100.0	100.0	98.8	1.2	1.2
3/4"	77.2	100.0	100.0	88.6	10.2	11.4
1/2"	37.6	95.6	100.0	68.3	20.3	31.7
3/8"	19.6	85.2	100.0	58.2	10.1	41.8
#4	3.0	18.0	97.6	42.0	16.2	58.0
#8	2.0	3.9	79.1	32.7	9.3	67.3
#16	1.6	2.0	62.4	25.7	7.0	74.3
#30	1.5	1.7	46.4	19.3	6.4	80.7
#50	1.4	1.6	25.5	11.0	8.3	89.0
#100	1.4	1.5	7.1	3.7	7.3	96.3
LBW	1.0	1.3	1.0	1.0	2.6	99.0

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

nom. max., #100 and #200 sieves.

*% Retained must be at least 4% for each sieve except max.,

nom. max., #100 and #200 sieves.

*% Retained must be at least 4% for the 3/4" sieve when

a 1.5" max. size (nom. Max. 1.0") aggregate is used.

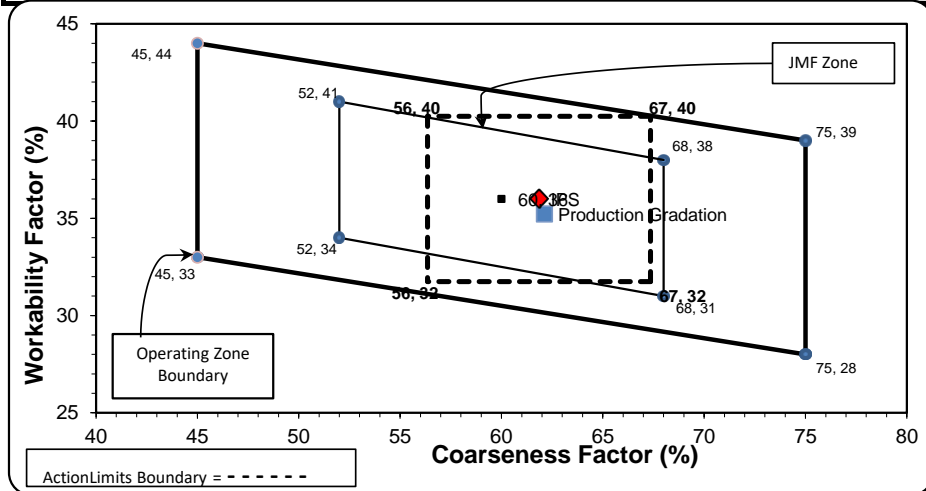
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	62	Workability Factor:	33
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Adjusted WF	35.2	Coarseness Factor:	62
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Workability Factor:	36
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	95.0	5.0	5.0
1/2"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

PREPARED BY:
SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-35**

Sample Date: 8/5/24

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 8/6/2024 through 8/12/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1375	8.19	2.69	46.6
26A	58-003	Stoneco	425	2.53	2.69	14.4
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

<----- Verify this number is 100%



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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.3	100.0	100.0	99.7	0.3	0.3
3/4"	76.6	100.0	100.0	89.1	10.6	10.9
1/2"	38.1	99.4	100.0	71.1	18.0	28.9
3/8"	13.3	83.0	100.0	57.1	13.9	42.9
#4	3.0	7.8	98.4	40.9	16.3	59.1
#8	2.2	1.8	87.1	35.2	5.6	64.8
#16	1.4	1.2	67.6	27.2	8.1	72.8
#30	1.3	0.9	46.6	18.9	8.3	81.1
#50	1.2	0.8	21.6	9.1	9.8	90.9
#100	1.2	0.8	4.1	2.3	6.8	97.7
LBW	1.4	0.4	0.6	0.9	1.3	99.1

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

nom. max., #100 and #200 sieves.

*% Retained must be at least 4% for each sieve except max.,

nom. max., #100 and #200 sieves.

*% Retained must be at least 4% for the 3/4" sieve when

a 1.5" max. size (nom. Max. 1.0") aggregate is used.

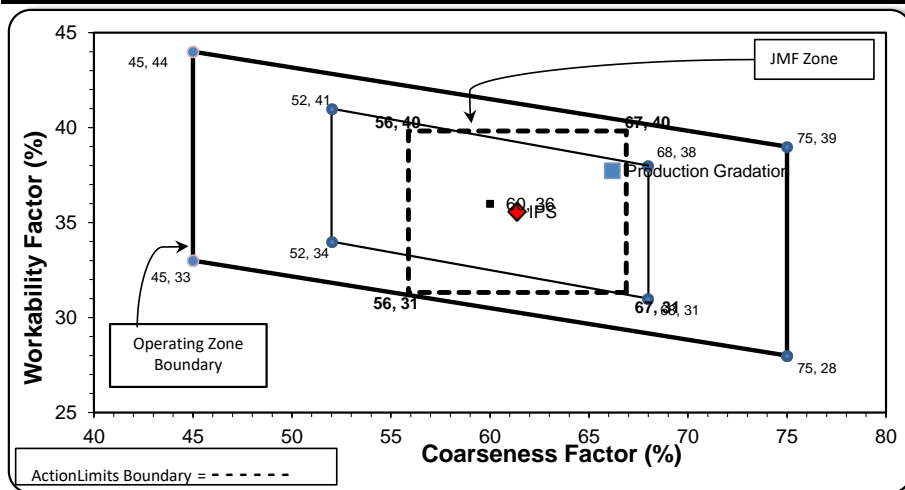
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	35	37.7
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Coarseness Factor:	61
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Workability Factor:	36
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.1	10.2	10.9
1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
#4	44.1	16.4	55.9
#8	35.6	8.5	64.4
#16	27.7	7.9	72.3
#30	20.6	7.1	79.4
#50	8.7	11.8	91.3
#100	1.6	7.1	98.4
LBW	1.1	0.6	98.9

PREPARED BY:
SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-38**

Sample Date: 8/5/24

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 8/6/2024 through 8/12/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1375	8.19	2.69	46.6
26A	58-003	Stoneco	425	2.53	2.69	14.4
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

<----- Verify this number is 100%

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.3	100.0	100.0	99.7	0.3	0.3
3/4"	76.6	100.0	100.0	89.1	10.6	10.9
1/2"	38.1	99.4	100.0	71.1	18.0	28.9
3/8"	13.3	83.0	100.0	57.1	13.9	42.9
#4	3.0	7.8	98.4	40.9	16.3	59.1
#8	2.2	1.8	87.1	35.2	5.6	64.8
#16	1.4	1.2	67.6	27.2	8.1	72.8
#30	1.3	0.9	46.6	18.9	8.3	81.1
#50	1.2	0.8	21.6	9.1	9.8	90.9
#100	1.2	0.8	4.1	2.3	6.8	97.7
LBW	1.4	0.4	0.6	0.9	1.3	99.1



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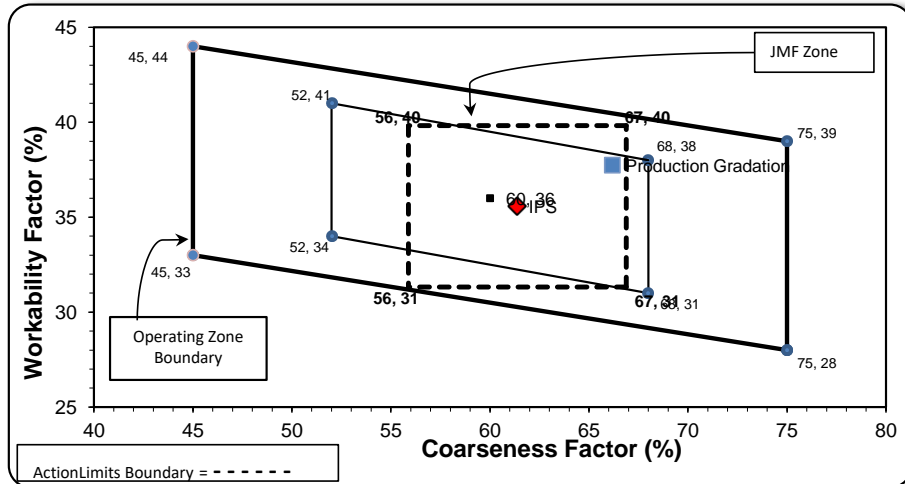
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	35	37.7
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Coarseness Factor:	61
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Workability Factor:	36
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.1	10.2	10.9
1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
#4	44.1	16.4	55.9
#8	35.6	8.5	64.4
#16	27.7	7.9	72.3
#30	20.6	7.1	79.4
#50	8.7	11.8	91.3
#100	1.6	7.1	98.4
LBW	1.1	0.6	98.9

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-O2**

Contractor: _____

Sample Date: 8/5/24

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/6/2024 through 8/12/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

<----- Verify this number is 100%

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.6	100.0	100.0	98.8	1.2	1.2
3/4"	77.2	100.0	100.0	88.6	10.2	11.4
1/2"	37.6	95.6	100.0	68.4	20.2	31.6
3/8"	19.6	85.2	100.0	58.3	10.1	41.7
#4	3.0	18.0	97.6	42.0	16.3	58.0
#8	2.0	3.9	79.1	32.7	9.3	67.3
#16	1.6	2.0	62.4	25.7	7.0	74.3
#30	1.5	1.7	46.4	19.3	6.4	80.7
#50	1.4	1.6	25.5	11.0	8.3	89.0
#100	1.4	1.5	7.1	3.7	7.3	96.3
LBW	1.0	1.3	1.0	1.0	2.6	99.0



Superior Materials, LLC
 30701 W. 10 Mile Rd.
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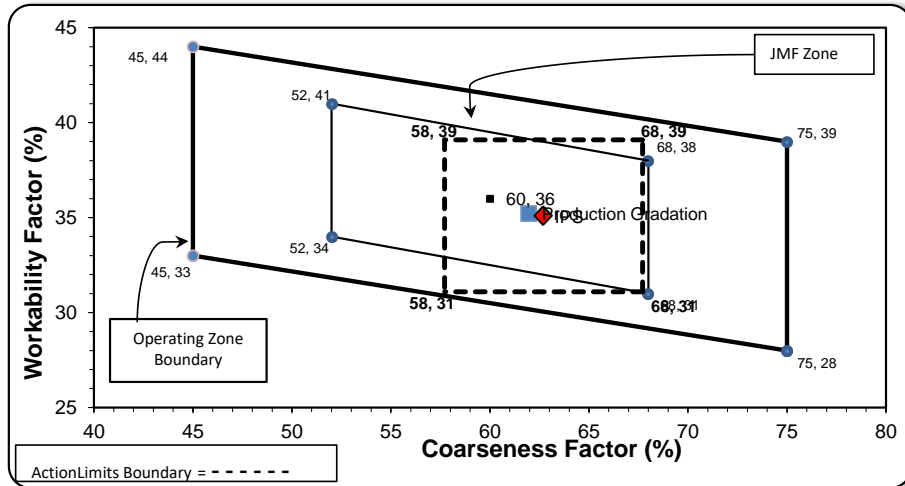
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 **% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 ***% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Initial Production Sample (IPS) Adjusted WF

Coarseness Factor:	62	Workability Factor:	33	35.2
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Coarseness Factor:	63
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Workability Factor:	35
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	95.1	4.9	4.9
1/2"	74.6	20.5	25.4
3/8"	59.3	15.3	40.7
#4	42.1	17.2	57.9
#8	35.1	7.1	64.9
#16	29.2	5.9	70.8
#30	21.9	7.3	78.1
#50	9.6	12.4	90.4
#100	2.4	7.2	97.6
LBW	0.9	1.5	99.1

PREPARED BY:
 SM, LLC Technical Service

Approved By: